In the Claims

1 (original). An improved time temperature integrator system comprising time temperature integrators comprising a reaction rate mechanism having a reaction rate constant (k); wherein the reaction rate mechanism exhibits temperature sensitivity; wherein the improvement comprises a reaction rate mechanism that exhibits zero-order decay when exposed to a temperature, measured in Kelvin, according to the equation $e^{\left[64.86-\frac{17311}{Temp(K)}\right]}$.

2 (original). An improved fresh food and perishable products monitoring system comprising time temperature integrators comprising a reaction rate mechanism having a reaction rate constant(k); wherein the reaction rate mechanism exhibits temperature sensitivity; wherein the reaction rate mechanism decays when exposed to temperature; wherein the improvement comprises a reaction rate mechanism approximated by reaction kinetic schemes.

3 (original). The system according to claim 2, wherein the reaction rate mechanism of a safety time temperature integrator exhibits zero-order decay when exposed to temperature.

4 (original). The system according to claim 3, wherein the zero-order decay of the reaction rate mechanism of a safety time temperature integrator approximates depletion of lag time for pathogenic microorganisms.

5 (original). The system according to claim 4, wherein the pathogenic microorganism is selected from the group consisting of *C. Botulinum*, enterotoxigenic *E. coli*, salmonellae sp, exotoxin *shigalla dysenteriae*, *staphylococcus aureus*, enterotoxin *Klebsiella pneumoniae*, *Bacillus cereus*, *Vibrio parahaemolyticus*, *Vibrio cholerae*, *Campylobacter jejuni*, *Campylobacter jejuni*, *Yersinia enterocolitica*, Exotoxin *Pseudomonas aeruginosa*, *C. perfringens*, *Versinia enterocolitica*, and *Listeria monocytogenes*.

6 (original). The system according to claim 3, wherein the reaction rate mechanism of a safety time temperature integrator approximates depletion of lag time for temperature sensitive phenomena selected from the group consisting of sprouting, ripening, and spoiling.

7 (original). The system according to claim 2, wherein a natural log of a reference time temperature integrator's reaction rate constant is equivalent to a natural log of a safety temperature integrator's reaction rate constant at a critical temperature.

8 (original). The system according to claim 2, wherein the decay of the reaction rate mechanism of a reference time temperature integrator indicates fluctuations in temperature.

9 (original). The system according to claim 2, wherein a temperature sensitivity of a reference time temperature integrator's reaction mechanism is different than a temperature sensitivity of a safety time temperature integrator's reaction mechanism.

10 (original). The system according to claim 2, wherein the reaction kinetic scheme is zero-order.

11 (original). The system according to claim 2, wherein the reaction kinetic scheme is first-order.

12 (original). The system according to claim 2, wherein the reaction rate mechanism is a function of temperature and is optionally estimated using fitting functions.

13 (original). The system according to claim 12, wherein the reaction rate mechanism is estimated using fitting functions.

14 (original). The system according to claim 13, wherein the fitting function is a zero-order approximation.

15 (original). The system according to claim 13, wherein the fitting function is a first-order approximation.

16 (original). A method for monitoring perishability and safety of fresh food or other perishable products, wherein the method comprises:

a) providing a fresh food and perishable products monitoring system of claim 1;

b) attaching the fresh food and perishable products monitoring system to a packaged fresh food or perishable product;

c) observing the rates of change in each of the time temperature integrators; and

d) comparing the rates of change in each of the time temperature integrators.

17 (original). The method according to claim 16, wherein rate of change is indicated visually by a change of color; wherein the observing step comprises measuring the change in color with a spectrometer or a color chart.

18 (original). The method according to claim 16, wherein the rate of change, extent of reaction of each of the time temperature integrators or both the rate of change and extent of reaction of each of the time temperature integrators is calculated.

19 (currently amended). The method according to claim 16 ~~or 18~~, wherein the calculation performed by each of the time temperature integrators is displayed digitally, as a change of color, by a variable indication against a fixed scale or any combination thereof.

20 (original). The method according to claim 16, wherein the perishable product is a reduced-oxygen package of fresh fish.

21-22 (canceled).

23 (new). The method according to claim 18, wherein the calculation performed by each of the time temperature integrators is displayed digitally, as a change of color, by a variable indication against a fixed scale or any combination thereof.